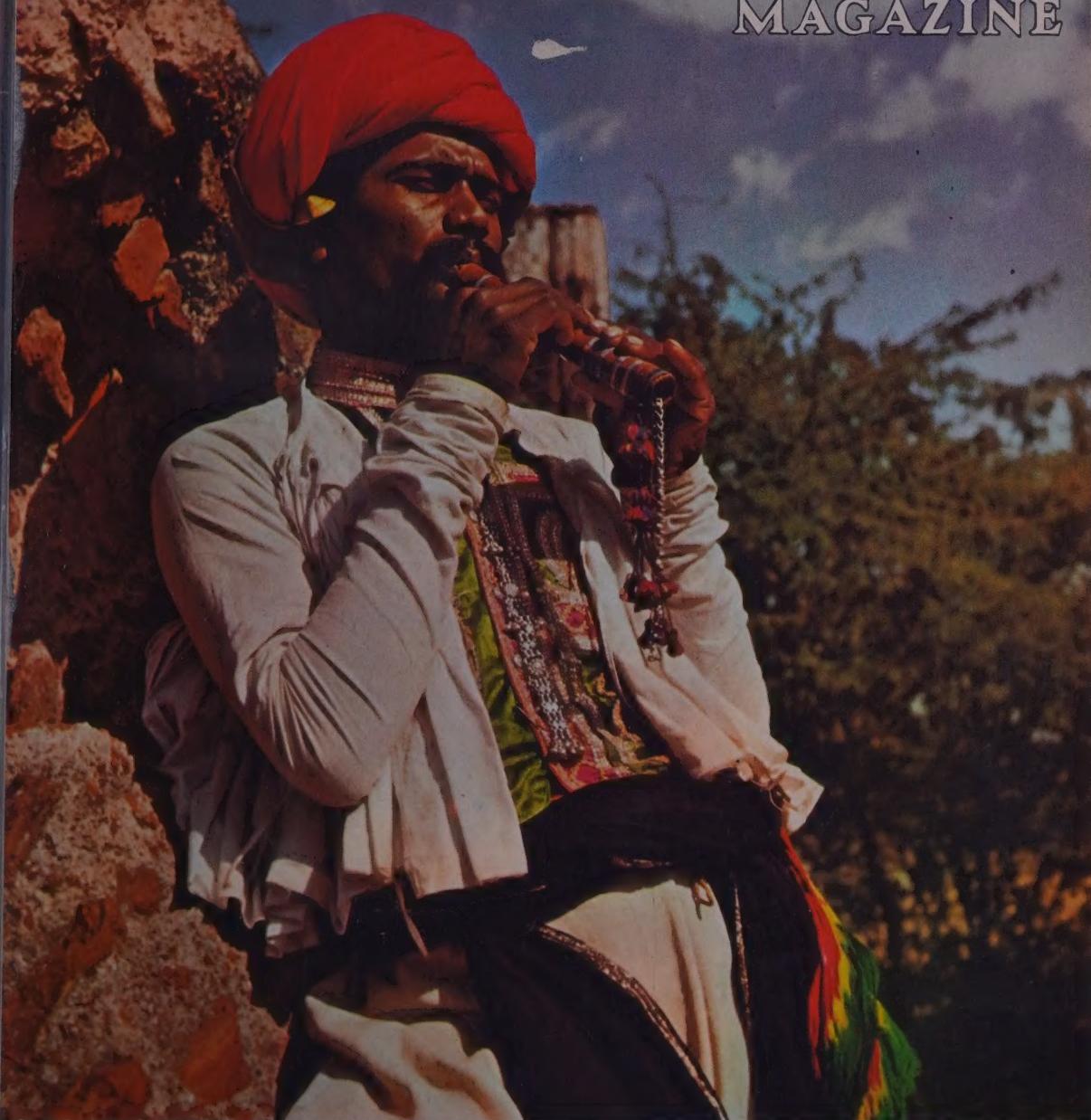


The

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GEOGRAPHICAL

MAGAZINE



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Dragon Boat Festival

Notes and Photographs
by PETER GOODWIN



The Dragon Boat Festival, one of the most popular of Chinese religious observances, is held in Hong Kong, and in numbers of Chinese cities as well, in June every year.

It is always referred to by the Chinese as 'Wu Yueh Chieh', the Fifth Moon Festival or the Double Fifth, as it falls on the Fifth Day of the Fifth Lunar Moon. It commemorates the death of a much-loved scholar-statesman, Wat Yuen, who lived in the era of the warring kingdoms of China some 2000 years ago.

Wat Yuen wrote a number of poetical works, the best-known being Li Su, which has been translated into several languages including English, French and Russian. Legend has it that Wat Yuen drowned himself in the river Mik Lo, in what is now the Hunan Province of China, on the Fifth Day of the Fifth Moon, as a protest against the misrule of the Prince of Tso and his Court. The people of Tso, who loved the poet greatly, were so grieved by the sad news that they raced to the scene in their boats in an attempt to rescue him. But, alas, they were too late and they failed to recover

his body. They then threw small packets of rice into the water in the hope that the fish would eat the rice and not the missing body.

This legend has exactly the sort of semi-historical basis which the Chinese love to attribute to far-distant myths. They believe that it is necessary to propitiate the ghosts of the drowned by offerings of rice cast upon the waters. According to their beliefs the Dragon is the Controller of the Waters, and the boat contests staged on this day are representations of dragon fights in the heavens between the rival Controllers.

For the Chinese in Hong Kong the boat races, which are only part of the celebrations, the holiday part, are held in several centres on the Island, in Kowloon and in the New Territories, and conform to a similar pattern of procedure. At each of the centres the organizers of the races have some distinguished guest—Chinese or English—to grace the occasion: at the main centre selected for the year it is the Governor of the Colony who presides and gives away the prize.



When I saw the race, it was at the main centre and held, therefore, before the Governor. His pavilion was gaily decorated with banners and bunting with Chinese designs. Every stand and seat was filled to capacity. Thousands lined the hillsides overlooking the water and thousands more watched from the rooftops of buildings nearby.

In front of the main pavilion was the course, a stretch of water about thirty yards wide by about half a mile. Boats of every description lined either side of the fairway: yachts; magnificent Chinese fishing-junks, their sails furled and every part of their rigging occupied by spectators; and easily manoeuvred wallah-wallahs, filled mostly with Chinese youths of all ages and sizes, appropriately dressed in bathing trunks so that they could swim whenever they felt like it.



The Dragon Boats, the craft used in these races, are always carried with impressive ritual to the water from the stocks on which they have been resting for the past year. As the boats are taken down, large crowds of spectators press in on either side and brief religious rites are performed by monks, who sprinkle water on the dragon's head which adorns the prow of each boat. Prayers are said for success in the races and each prow is decorated with red flowers. The blessing makes the boats eligible to enter the races on the final day.

The boats are of different sizes and are usually from 80 to 120 feet in length with a beam of about 4 to 5 feet, drawing about 2 feet.

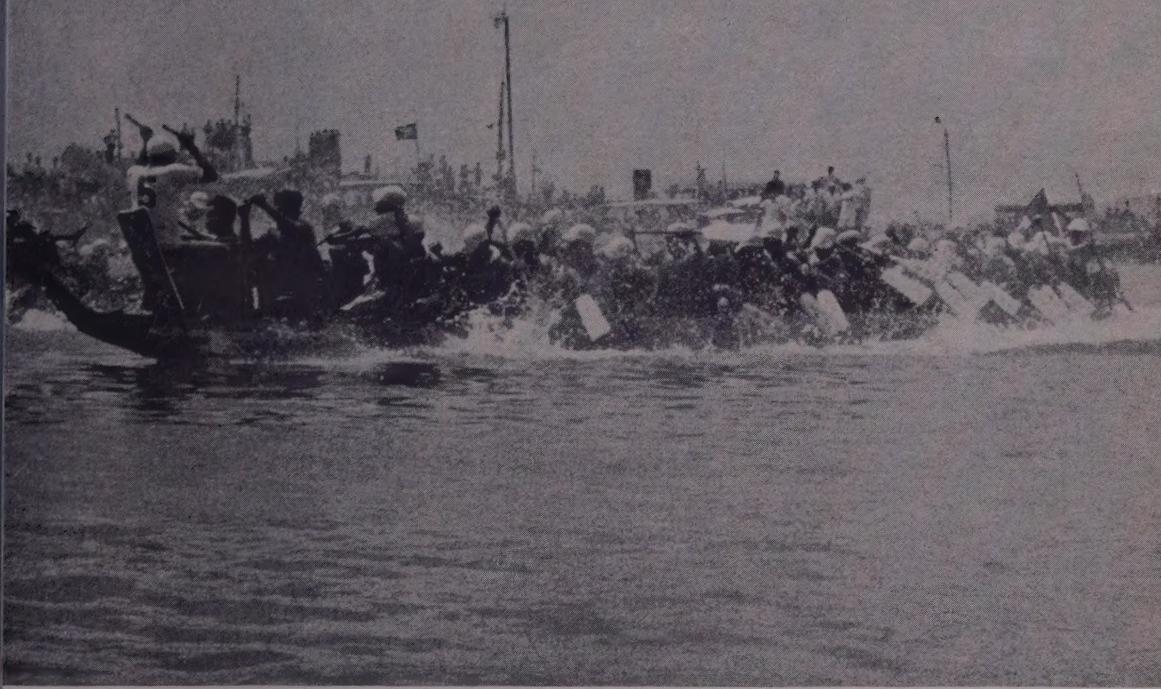
The crew of each boat numbers around forty to sixty. There is very little freeboard when they are in position and the splash of the paddles usually drenches them with water. The prows of the boats are ornamented with a grotesque-looking carved dragon's head and the stern with the dragon's tail. Every boat has its distinguishing colours which are carried as a triangular banner on a long pole, and there is a large drum on which one of the crew beats time for the rowers.

After the launching of the boats the crews selected to row in them go into strict training, so as to keep in the best possible shape for the races.









The races of the Dragon Boats are tremendously exciting: one contest is barely over before the next boats are on their way to the starting point. To the vociferous cheering of the thousands of spectators—gesticulating wildly to encourage their favourite crews—race followed race. Throughout the day the boats kept hard at it, drums beating fiercely. The glare, the riot of colour against a background of cloud-torn skies, the noise of bursting crackers which accompanied each race from start to finish, and the hoarse and lusty cheering from thousands of throats—all these engendered an almost uncontrollable excitement.

Then came the final race to determine which district's boat would have the honour of winning the coveted pennant of leadership. At the earlier preliminary races a number of boats had been eliminated and only four boats now paddled to the starting point.

Junks and yachts jostled for position, wallah-wallahs darted in and out; police launches had their hands full. Then the starting gun went off amidst an ear-splitting burst of crackers.

The boats came on at a terrific pace, racing neck and neck, the drummers working the rowers up to a frantic pace, and with colours flying they swept past in a cloud of spray, the circular motion of the small paddles working in unison and whipping up the foam.

The last few yards were a frenzied flurry. The noise of the crackers and the cheering of the spectators were deafening as the leading boat swept past the winning-post.

To thunderous cheers the Governor presented the pennant of leadership to the winners, who carried it proudly aloft. Gradually the cheering died away, the vast tangle of boats unravelled itself, and the spectators took their way home chattering excitedly about the day's events.

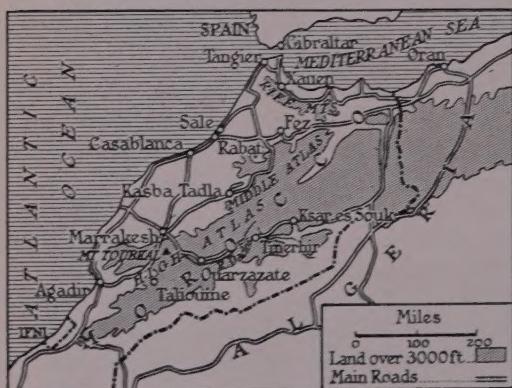
Morocco: Land of the Setting Sun

by MARGARET POPE

MOROCCO is a country of infinite contrasts. In Arabic, it is called the Maghreb—the land of the setting sun; and so indeed it is. Nowhere in the world is the sunset so unforgettable: the golden light tumbles in cascades into the lakes and rivers and into the deep valleys of the High Atlas, touches the snow-capped summits and a thousand minarets, sweeps the cork forests and the grain fields of the coastal plains and spills far out into the ocean; the division between land and sea is obliterated, the whole world is drenched in golden light, and far out on the horizon the great red ball of the sun topples, almost spins, into oblivion. One, two, three seconds pass—then the disc has disappeared, leaving trails of violent red and purple across the sky. There is no twilight. The Moroccan night has fallen.

Moroccans call this moment the cup of gold. If you hold a glass up to the setting sun, they say, it fills with a strange magic. Could you drink it, you would become deliriously happy. Perhaps. But I know of nothing quite so moving and mysterious as the quality of the light over the Moroccan landscape, particularly at sunset.

Morocco is also an extremity of the East, for it is the most westerly point of the Orient. As the traveller breakfasts on the balcony of his 20th-century hotel in the new town of Fez, he can peer down into the Middle Ages. For in that Medina, the old heart of the city, with its crazy design of winding alleys, flat roofs and tiled mosques and sanctuaries, streets thronged with pack-animals and pedlars, portly merchants and pale-faced students, is a design of life that goes back 1100 years—and still goes on.



A. J. Thornton

Before I went to Morocco I had heard so much about Fez and the Fassis that I did my best to keep aloof from its spell-binding effect. Fez is a great rambling overcrowded city. Not everything is picturesque—I have never been able to appreciate the charms of poverty—and much of what is sold in the famous Fez markets is shoddy. There is nothing in my opinion so hair-raisingly vulgar as the great bales of plush and velour furnishing material which many Moroccans admire so much and buy in enormous lengths, to bedeck their otherwise delightful divans and cushions. The Medina of Fez, I told myself, is where one gets jostled and exhausted, and weighed down with history. There is really too much Old City about it, yet I have to admit that every time I go to Fez the same thing happens: no sooner have I passed under the great gate, the Bab-Boujeloud, firmly resolved, of course, not to go near the bazaars—than I am lost. Down I go a few steps, and inevitably out of the corner of my eye I glimpse a perfectly exquisite wrought-iron lantern, dangling from the porch of an antique shop, next a pair of fine brass candlesticks. Then I decide that I may as well invest in yet another pair of those deliciously supple leather slippers. Before long I am sitting mesmerized in the middle of an immense carpet shop, sipping mint tea and, by now absolutely penniless, watching a cunning Fassi merchant display, one after another, his superb collection of handwoven carpets—thick pile beauties for palaces, long wool rugs from the High Atlas, camel-hair blankets in their old and curious designs. And so my Odyssey continues, past the wood-carvers and cabinet-makers, the potters, the engravers, the gold- and silversmiths—each craft in its own particular quarter exactly as it was organized in the mediaeval guilds. Finally, hours later, I emerge at the Gate—laden with treasures, exhausted but happy.

Last time I visited Fez it was on the occasion of the 1100th birthday of the University of Karawiyeen. Visitors were invited to come down and take a look at the exhibition of manuscripts in the Karawiyeen Library. As we approached the door I was amazed to see that just under the windows was the coppersmiths' quarter, with hundreds of craftsmen hammering away. The clamour was deafening. 'How can anyone con-



All Ektachromes by A. Costa

The new Bab-Boujeloud, between the Medina and the rest of the city of Fez. One side is decorated in blue faience, the other in green

The Royal Guard outside the palace of the King of Morocco at Rabat. The guard accompanies the King when he goes each Friday from his palace to the Mosque to pray, along a route lined with troops: horsemen and officials on foot follow the King's carriage





The bathing-pool of the royal summer palace outside Rabat where the King receives foreign envoys in audience. It was built after Morocco's independence in 1956, and reflects the remarkably high standard of present-day craftsmen working in the traditional style



A market scene at Ouarzazate, an oasis south of the High Atlas

Tinerhir, once a garrison outpost at the entrance to the gorges of the River Todra. Being made of easily perishable sun-baked bricks these oasis forts never last for a very long time, but when they have to be rebuilt, it is always in the same immemorial fashion



A petrol-seller in Taliouine. Like everyone in this region he carries a bag for his money, which is made of embroidered leather





A market scene beneath the walls of the Kasbah in Xauen, in what used to be Spanish Morocco. The fort dates from the Middle Ages. The roofs tiled in the Andalusian style are typical of the city



A *souk* (or bazaar) in the old part of Marrakesh, shaded against the intense sunshine by an attractive patterning of lattice-work

centrate in a library with that fearful noise outside the windows?" I shouted to our guide, a professor from the University. He smiled wryly and beckoned me into the library. And then as the great oaken door was shut behind us I understood. Within these thick walls all was calm: the only sound was that of the splashing of the fountain in the midst of the tiled courtyard. In the reading rooms venerable scholars in white *jellabas* and young students in slacks and sweaters pored over manuscripts, some of them written by scholars from this university 800 years ago.

Well, that is Fez. In and out of time. I still insist that I prefer other cities of Morocco. Yet I must admit that Fez is the most remarkable.

Rabat is the administrative capital of Morocco—a city of gardens and villas, government offices and apartment houses, all rather new and dazzlingly white. I am very fond of Rabat: it is a pleasant small town steeped in history but not weighed down with it like Fez. A river called the Father of Reflections (*Bou Regreg*) divides it from the sister city of Sale, and in the evening you can sip an aperitif and watch the sun go down from the parapet of a café that was once a pirate's fort.

Rabat is busy as a bee all day; the centre of activity is the palace where King Mohammed V and his son, the Crown Prince Moulay Hassan, not only rule but govern. Nevertheless, despite the fact that there is as yet no Parliament, there is plenty of freedom and democracy in Morocco—a lot more than in many countries on the other side of the Mediterranean.

The people of Morocco are impatient for change, and though they may prefer sweet mint tea to coffee they also prefer to live in small modern villas rather than the old, magnificent but chilly family mansions. Social habits are changing fast in Morocco. You see this, for example, in the extraordinary variety of costume. Well-to-do government officials and businessmen pass by in smart Western dress, some of the older ones wearing a long white *jellaba* over their suit. Women and girls may be in modern dress—the latest fashions from Paris—or, by contrast, completely covered in long dark *jellaba* and veil; or in *jellaba* with no veil. The great majority of young girls do go unveiled, but women are not as emancipated as in Egypt and Tunisia.

Some four hours' drive to the north of Rabat is Tangier, the stepping-stone to Europe and Morocco's most cosmopolitan city. Already perhaps the best-known town for foreign tourists, it is now also becoming a holiday-centre for

Moroccans themselves. The thing I like most about Tangier is its natural beauty; the thing I like least is the eccentric foreigners, most of whom turn out to be crashing bores.

Much as I love the sea, and to live near the sea, I also have a passion for mountains, and Morocco is one of the fortunate countries where you can conveniently indulge both. The Riff Mountains in the north and the Middle Atlas are crowned with cedar forests. The High Atlas, on the other hand, is the real thing for the climber. This summer I explored for the first time the high valleys of the central range and climbed to the summit of Toubkal, Morocco's highest peak (13,600 feet), and discovered a whole new world of mountain people living locked away amid their tiny patches of maize and spreading walnut trees.

The road to the High Atlas and the far south leads through the southern capital—the great old pink-walled city of Marrakesh. I like Marrakesh for many reasons: for its feeling of space, its sharp dry cold air in winter, its surrounding sea of green palms, and above all for the vista of snow-capped peaks beckoning from the south. Marrakesh is the meeting-place of people from the mountains and the plain; in the immense central square, shepherds mingle with shopkeepers, strolling minstrels perform side by side with the traditional story-tellers or the vendors of amulets and charms.

Once in Marrakesh your heart is lost to the south. The signposts point to the high passes with Berber names—the Tiz N Test, the Tiz N Tishka—and through them on the other side down to the Kasbah road, along which picturesque forts are strung out from Ksar es Souk in the east down to Ouarzazate. Contrary to what I expected, this is not the desert, the Sahara is still many miles to the south, but it is an immense stony plain where at first it appears that nothing grows and no birds sing. But there are birds, and animals in plenty—gazelle and wild boar—and strange plants. Along this road are many surprises: the hidden rose gardens from which are extracted the essence, and, not far off, the majestic gorges of the Todra and the Dades—tremendous gashes in the mountainside cut by the ferocity of the waters seeking their outlet from the heights above.

Morocco, like most rich and complex things, is difficult to sum up and impossible to compare. It is a mosaic of strange and complicated design: beautiful, baffling and mysterious.

The Seaman's Chart

by

PETER CLISSOLD

Lecturer at the School of Navigation, University of Southampton

THE seaman's chart has developed in the last 700 years from a mere pictorial note into a scientific instrument of some precision. It has always had, too, an artistic charm and evokes an interest far beyond its simply utilitarian purpose; where the earlier cartographer was unable (from lack of information) to supply navigational detail he placed drawings of ships, sea-monsters and other ornamentation, some of which was useful as well as decorative: flags in drawings of ports, for instance, indicated their political allegiance.

The earliest chart of which we still have a specimen is drawn on sheepskin and dates from about 1275. It represents the Mediterranean and adjacent seas, and must have been based upon the knowledge accumulated by many pilots in the Mediterranean area, for the Mediterranean itself is remarkably correct in detail, while the Atlantic coasts are extremely vague. Distances and directions can be measured on it; there is a scale of distance running north and south and a second scale running east and west.

One of the striking features of old charts is the rhumb-lines radiating from the compass roses. These were used by the navigator in measuring the course to be steered, for he had no parallel rules of the kind we have today. He would place a ruler between his position on the chart and the harbour for which he was bound, and then, using his dividers, find the rhumb-line most nearly parallel to it and steer that course.

Charts as yet showed no latitudes or longitudes and it was not until the 15th century, when the Portuguese were exploring to the southward under the direction of Prince Henry the Navigator, that it became usual to project charts upon a network of latitude and longitude. Indeed, although the latitude of places was early determined, the longitude was a matter of much greater difficulty. However, as the mariner had no means of knowing his longitude other than by estimating how far he had sailed in an east or west direction, this was for a long time considered of less importance than might be supposed. On

some early charts the island of St Helena, for example, is marked in two places, one at each of the limits of longitude between which it was believed the island must lie, but both in the proper latitude. To find such an island, the practice was to sail to the correct latitude well to windward of the island and then turn east or west and so continue until it showed up. Not until well after 1761, when John Harrison had produced the first efficient chronometer, did the navigator expect to find his chart correct for longitude.

As it is not possible to represent a curved surface upon a flat one correctly in every respect, you have to use the projection most suitable to your purpose. The sailor's chief requirement in a chart was—and is—to be able to measure direction and comparatively short distances accurately. This he is able to do on the Mercator projection, because the meridians (imaginary lines running between the poles) are all drawn parallel to each other, and he has only to measure the angle between any meridian and a line joining his positions of departure and destination to find his course. Meridians on the globe, however, are not parallel with each other but converge on the poles. On the chart they are expanded sideways the closer they approach the poles, and the parallels of latitude must be expanded northward and southward in proportion in order to preserve the right shape of the coastline. The scale of distance is therefore an unequal one, the distance representing one mile being greater on the polar than on the equatorial part of the chart. Distance is therefore always measured along a varying latitude scale at the side of the chart.

Although the Mercator projection is very suitable for coastal seas it is useless in polar areas, and everywhere suffers from the disadvantage that a straight line joining two places (unless they are due north and south of each other) is not the shortest distance between them. For long voyages this difference may be considerable, and one of the ways by which we can

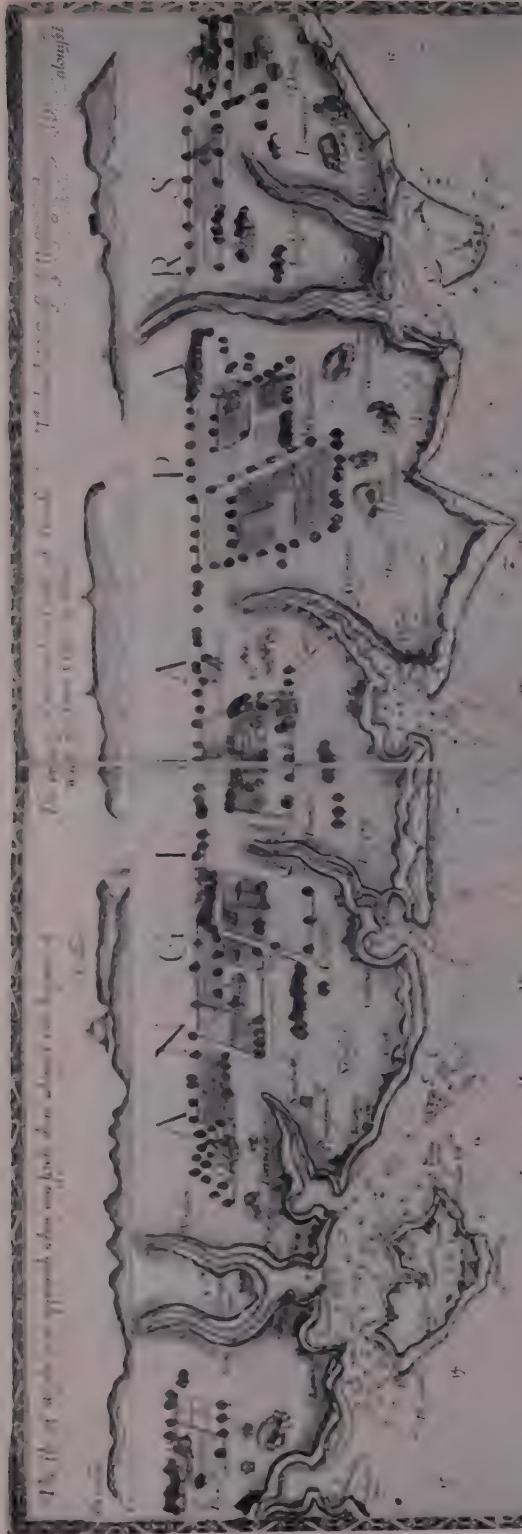
A Portuguese portolan chart of the Mediterranean, about 1585, ascribed to Simon Fernandez. There are many compass roses and rhumb-lines for measuring direction, and two scales, one horizontal and the other vertical, for measuring distance. Flags indicate the political allegiance of the main ports



A chart of the English coast from the Isle of Wight to Dover, from Ashley's *Mariner's Mirror* of 1588. The coastline was not the same as it is now; Langstone and Chichester harbours are not shown at all; Rye and Winchelsea are still ports. The views at the top help the mariner to identify landmarks.

THE CHANNEL BETWEEN
ENGLAND AND FRANCE

THE SEA COASTES OF ENGLAND



find the shortest track is to use a chart drawn upon a Gnomonic projection. To produce this kind of chart the maker assumes himself to be at the centre of a transparent globe upon which the meridians and parallels of latitude are inscribed, and that the chart touches the globe at one point. The advantage of this projection is that Great Circles drawn upon the globe show as straight lines upon the chart, and a line joining the points of departure and destination will be the shortest distance between them. One cannot measure direction upon such a chart, and so a series of positions along the Great Circle track are taken off the Gnomonic chart and plotted on a Mercator chart, where, when joined, they show a curved track, which is, none the less, the shortest route.

The marine surveyor has two basic survey methods at his disposal. One of them is the running survey, made by steering along a coast keeping as careful an account as possible of courses steered and distances run, taking frequent bearings of prominent landmarks to fix their positions, and sounding the depths as he goes. Today, with the help of gyro-compasses and sensitive logs for measuring speed and distance, with photographs perhaps of the radar screen to delineate the coastline, quite good and rapid, though limited, results can be obtained; but the ship's progress may be (and probably is) affected by unknown tidal streams or currents.

The more thorough way, based upon a land survey, has been followed whenever possible since 1750, when Murdoch Mackenzie started his survey of the Orkney Isles with theodolite and chain. If the coast has not already been accurately mapped the surveyor must begin by measuring a base line. From each end of this line angles are measured between marks set up for the purpose and a process of triangulation begun which can be continued indefinitely. When the survey must be carried to seaward beyond the visible range of shore marks (to fix, for instance, the position of outlying reefs), floating marks must be precisely anchored. The distance steamed may be accurately measured by taut-wire measuring-gear, by radar or by specially established Decca radio beacons.

Among the many things a navigator expects to find upon his chart, the depth of water is one of the most important. Lines of soundings are run from marks set up on shore, the boat's position being fixed at each sounding. It is an impressive sight to see a skilled crew engaged in

this work, with a leadsmen on each side of the boat constantly heaving the lead while two surveyors check their position by horizontal angles taken by sextant. Nowadays depths are normally obtained by echo-sounder, which not only enables the work to be done more easily and speedily but gives a continuous record of the depth of the sea-bed. Other things which must be marked on the chart besides the depths of water are the nature of the sea-bed, the direction and strength of tidal streams, the height of conspicuous landmarks, characteristics of lights, positions of wrecks: everything, in fact, which may help the navigator to conduct his ship safely by day or by night.

When the survey is completed a 'fair chart' is prepared. From this the cartographer prepares a copy for the engraver, who produces a permanent, but alterable, plate from which a large number of charts can be printed. Copper plates are still sometimes used and some engraving is done by hand, but more often enamelled zinc plates are used and prepared by photographic methods.

The Admiralty navigational charts are wonderful productions and remarkably cheap for their quality. They range from small-scale charts of whole oceans to large plans which show in great detail the features of harbours and ports. There are charts too for other purposes: track charts; charts for weather maps; charts showing dangerous mined areas, and so on.

The International Hydrographic Bureau, whose headquarters is in Monaco, has existed since 1920 to coordinate the hydrographic work carried out by different nations, but until recently navigational information was jealously guarded—even now some nations are still secretive about this, as about other matters. The first Elizabethans used captured charts of the New World and were not above capturing pilots and using them too, as Drake did during part of his voyage round the world. The publishing of charts was then a private and business affair and a few firms still exist—the direct descendants of the earliest chart purveyors—who produce charts for special classes of customers, such as yachtsmen, basing them upon governmental surveys.

The first printed collection of charts which was available to seamen and which enjoyed a large success was produced in Holland by Lucas Wagenaer about the time of the Spanish Armada. In his *Spiegel der Zeevaerd*, charts and plans were reproduced on moderate-sized pages

KARAMANIA

CHART II.

CHART II

John Kallioinen to John Kanavosky

PROVINCIAL or ABALIA the ancient Paphus.



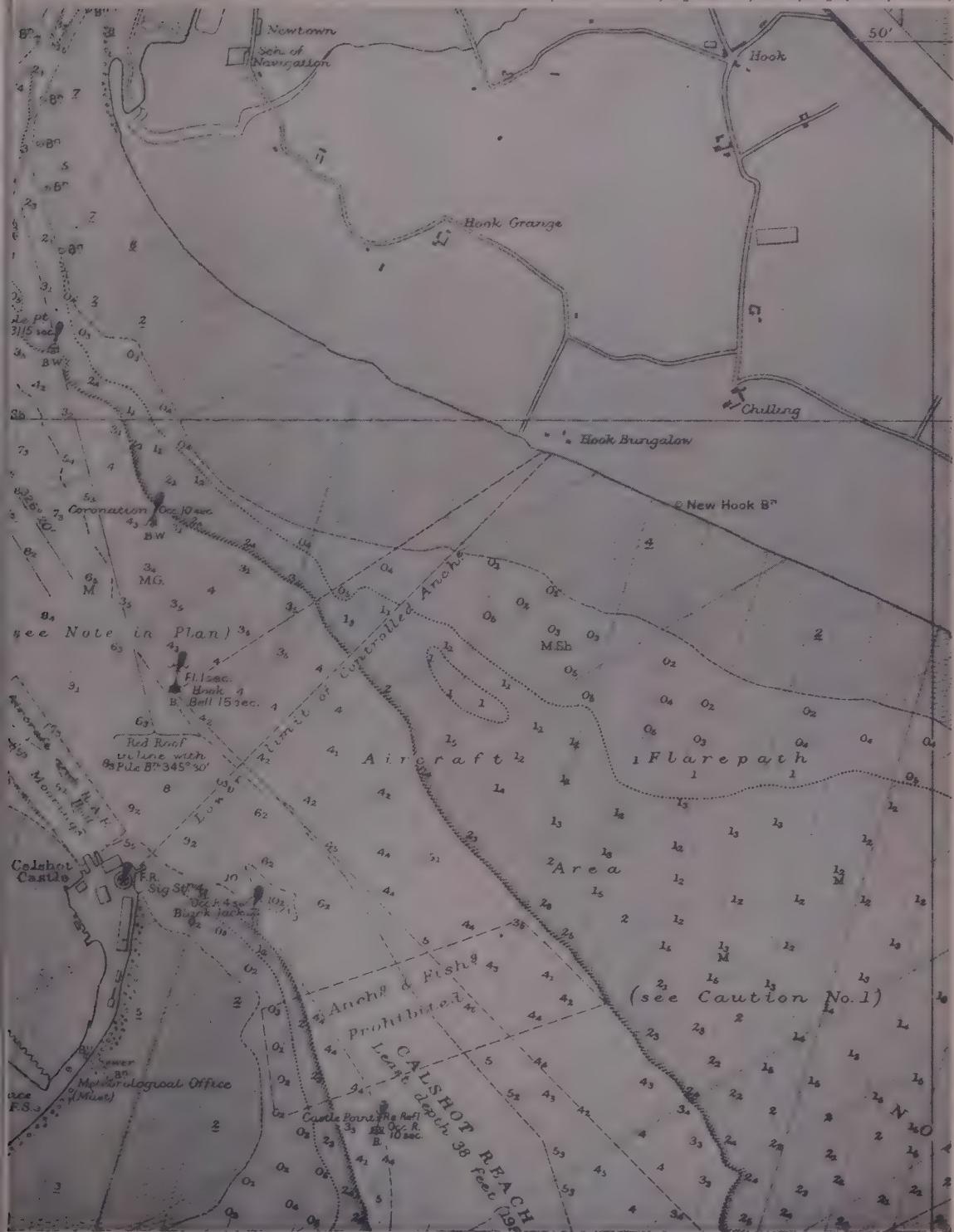
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By courtesy of the Hydrographer of the Navy

The Gulf of Antalya in southern Turkey, surveyed by Rear-Admiral Sir Francis Beaufort in 1810 when captain of the frigate *Fredriksteen*. It is a beautiful example of the hydrographer's art

A portion of a chart of Southampton Water on which Decca lattice lines are superimposed. With the aid of a special receiver, the navigator can tell along which lines his ship is situated

Reproduced from Admiralty chart No. L(D5)1905 with the permission of the Controller of H.M. Stationery Office and of the Hydrographer of the Navy

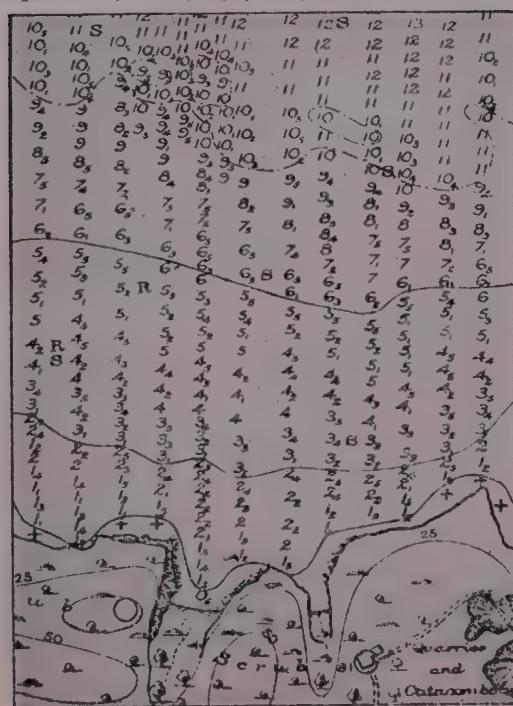




(Left) A sample chart of a very small harbour, Loc Maria, off the coast of Brittany. It is based on a French Hydrographic Service chart, but enlarged and simplified for yachtsmen. (Below, left) A survey for which echo-soundings were used. Large figures show fathoms, small figures show feet. (Below, right) On the resulting chart only a selection of soundings appears. (Opposite, top) A radar view of the Thames estuary, centred on the end of Southend Pier. The display clearly shows the images of the Essex shore, and the Isle of Grain, the mouth of the Medway and Sheerness. The same area (opposite, bottom) can be compared on an Admiralty chart reduced to scale

Reproduced from Admiralty Charts with the permission of the Controller of H.M. Stationery Office and of the Hydrographer of the Navy

From Biscay Harbours and Anchorages, Vol. 1, by K. Adlard Coles (Adlard Coles Ltd, 1959)





By courtesy of Kelvin & Hughes Ltd

Reproduced from Admiralty chart No. L(DR)1185 with
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By courtesy of the Hydrographer of the Navy

H.M.S. *Vidal*, the most modern ship of the Royal Navy's Hydrographic Service

on the backs of which were sailing directions and information about the countries shown. The charts were later re-engraved in London and 'waggoners' (as they were called) were valued possessions of the master mariners. They were indeed over-valued, for, being drawn as plane charts, they were already out of date, as Edward Wright had by 1600 changed the scholar's map of Gerard Mercator into a sea-chart of the form now used.

The first marine survey of the British Isles was carried out between 1681 and 1688 by Captain Greenville Collins in the royal yachts *Merlin* and *Monmouth*, seventy-foot cutters with a draft of nine feet; handiness, rather than size, being the quality needed in a surveying ship. Captain Cook chose a collier brig for his exploration of the Pacific, and the wonderful world-wide surveys of the 19th century were done in sailing vessels which ranged from the little *Beagle* of 235 tons to the steam corvette *Challenger* of 2306 tons.

About 1760 the Admiralty ordered all information about harbours, tides, fortifications, etc., to be recorded, and captains and masters of ships made many surveys to supplement the very imperfect charts of the day. So much was accumulated that when, in 1795, the first

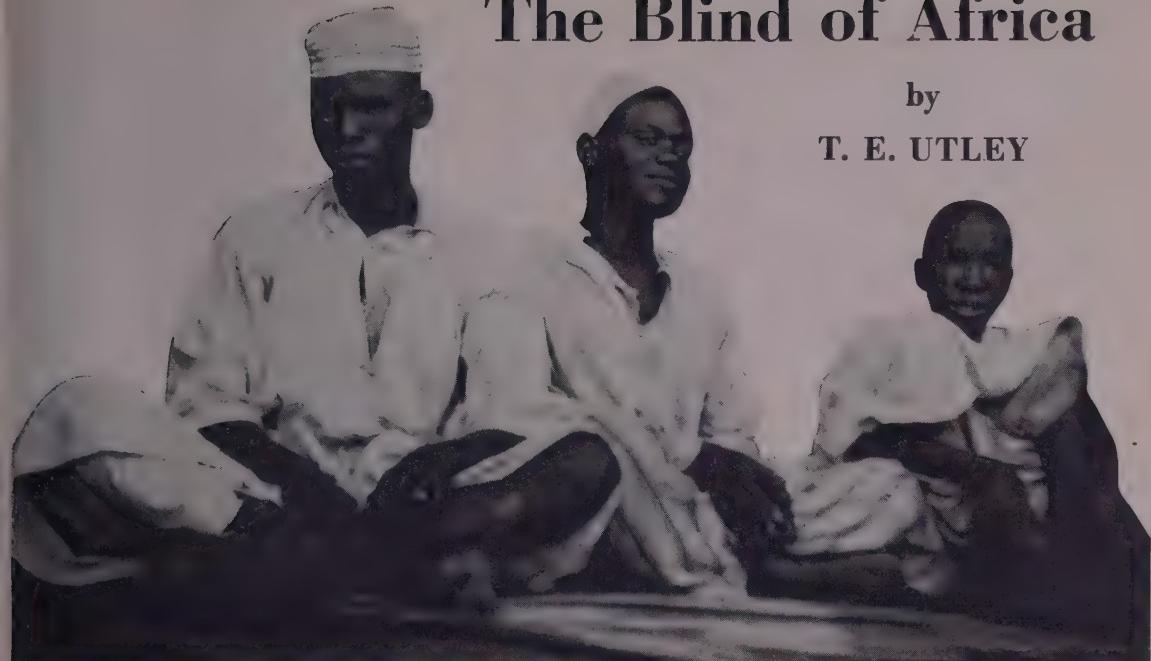
Hydrographer of the Navy was appointed (Alexander Dalrymple, an Honourable East India Company's man), he was faced with the task of sorting out a large collection of charts of varying quality covering extensive areas of the world. Hurd, who followed Dalrymple, was the first of the line of extremely able Royal Naval officers, all experienced marine surveyors, who have served as Hydrographers of the Navy. He managed, in spite of opposition, to make Admiralty charts available to the public; a step of great importance and one far less obvious than it would seem now when charts are not generally regarded as secret documents. From that time the Hydrographic Department of the Admiralty has continued the never-ending task of charting the seas—never-ending, because the sea-bottom and coasts, especially of estuaries and the great rivers of the world, continue to change. It produces today about 1,500,000 charts each year, 45 per cent of which go to overseas purchasers.

Surveying is always arduous and sometimes dangerous work. Though it is carried out by most maritime nations, we can be proud that a part, at least, of almost every sea coast in the world has at one time or another been surveyed by ships of the Royal Navy.

The Blind of Africa

by

T. E. UTLEY



All photographs by courtesy of the Royal Commonwealth Society for the Blind

THERE are, according to the most reliable estimates, about 3,000,000 blind people in the British Commonwealth. Of these, 2,000,000 live in the Indian sub-continent, 600,000 in Britain's dependent territories (when the calculation was made this included Nigeria), and 80,000 in Ghana and Malaya. The rest are distributed more or less in proportion to the populations throughout the older, self-governing states.

Clearly, blindness is not a serious social problem in Britain, Australia or Canada. Surgical and medical progress has worked wonders even in the last twenty years. Indeed, it seems for the moment that the limit of that kind of advance has been reached; only a hard core of incurable eye diseases, some of them hereditary, remains in the more advanced countries. Furthermore, the victims of these diseases are well cared for; the British seem, where the distribution of largesse is concerned, to be much better disposed towards the blind than towards any other object of charity with the possible exception of animals. Technical progress has also come to their aid. In the older Commonwealth countries there are blind clergymen, lawyers, dons and journalists, and blind engineers and telephonists. Braille, talking-books and innumerable other

devices now exist to mitigate the handicap, and more and more blind people earn their livings in competition with those who can see.

The contrast between blindness in a country like Britain and blindness in the less developed parts of the Commonwealth is staggering. To begin with, about two-thirds of the eye disease in Africa and Asia is either curable or preventable, very often by quite simple means. Nothing is lacking except surgical skill and equipment. Then again, the great majority of those who are blind live as beggars. Sometimes they are held in awe by the communities to which they belong, and are treated, as in Mohammedan territories, as divinely provided 'objects of affection', never in any circumstances to be allowed to raise a hand. Sometimes they are held in contempt. In either case, blindness is soon likely to be accompanied by other afflictions—by general constitutional weakness and extreme physical underdevelopment. Needless to say, it is always surrounded by superstitions. In Africa the notion is widespread that if a man goes blind, even as a result of an accident, he is likely to engender blind children.

In Africa, certainly, blindness is perhaps the greatest single social problem arising from



The bite of the *Simulium damnosum* fly which flourishes in the northern rivers and streams of Ghana has caused blindness in about 30,000 victims. An entomologist of the Royal Commonwealth Society for the Blind here examines a cage in which these flies had been bred experimentally

disease. Yet, until quite recently, very little was done about it. It is only ten years since a voluntary society, now known as the Royal Commonwealth Society for the Blind, came into being in London to combat blindness and its social effects. The Society, which had small initial grants from the Colonial Office and the Royal National Institute for the Blind but has otherwise been entirely financed by private subscription, starts or supports work for the blind in all the dependent territories of the Commonwealth and in those Commonwealth States which have achieved

independence since its foundation. Inevitably its work has been largely concentrated in Africa, and already it has remarkable results to its credit. As far as it can, it persuades governments to spend money on the prevention and cure of blindness and the training of the blind. Wherever a voluntary society existed to aid the blind, the new organization came to its support and invited it to affiliate; where work had to be done for which no provision was yet made, the Society itself undertook it and financed it. None of this would have been possible



In 1952-53 the ophthalmological team of the Society's West African Survey travelled 20,000 miles and surveyed 50 towns and villages; it examined 1500 cases and carried out 120 surgical operations, often under very difficult conditions. At times the operating theatre was a tent





Blind Nigerians at the Ikeja farmcraft centre near Lagos learn to grow eighteen different crops and to rear stock. Here, trainees prepare beds for vegetables and cut grass for compost. (Opposite) An official of the Nigerian Labour Ministry presents tools to a successful trainee





without generous support from British industries with interests in the territories concerned and without the powerful patronage of such men as the late Lord Halifax, who was the Society's first President.

The most dramatic achievement of this campaign has been the assault, which promises to be successful, on 'river blindness' in Ghana. This disease has devastated whole areas in the Northern Region of Ghana, and has caused what is one of the largest single concentrations of blindness in the world: there are places in this area where a fifth of the adult male population is blind. Migration from the districts most seriously affected has spread the disease, so that, for a long time, a considerable area of northern Ghana has been known as 'the country of the blind'.

The disease is produced by the bite of the *Simulium* fly, which breeds in the tributaries of the Volta river system. It produces a condition known as onchocerciasis, which may lead to the destruction of the optic nerve thereby producing irremediable blindness.

The two questions which the Society set out to answer were whether anything could be done by means of drugs to check the disease before it resulted in blindness, and whether it could be stopped at source by the destruction of the fly. Two survey teams were despatched to Ghana in 1952. One was entrusted with the ophthalmological side of the investigation and the other with its entomological aspect. In four years the teams covered thousands of miles between them, transporting heavy equipment in conditions of extreme difficulty. The conclusions of their enquiry have since appeared in two long books. If the disease is caught in the first stages there is now some prospect of curbing it; better still, a scheme has been sketched out for the gradual elimination of the fly by spraying the rivers and surrounding vegetation with insecticide. There is thus a good chance that within course of time 'the country of the blind' will be reclaimed. This would not have been possible but for the skill and courage of the two investigating teams; in particular, the task of catching the flies in order to subject them to pathological and other tests involved considerable risk. The Ghana Government is about to start putting into effect the recommendations of the two teams. The process of disinfecting the rivers will no doubt take a long time, but there is every reason to hope that it will prove practicable at an expense far less than that originally imagined. What the success

of this operation will mean in terms of human happiness and economic efficiency can easily be conceived.

Economic efficiency is indeed an important point in this context. The blind of Africa are costing the communities to which they belong considerable sums of money of a wholly unproductive kind. Begging is their natural occupation, though it is not usually so highly organized as it is in a remarkable community of 700 blind people in Kano, Nigeria. This is a Muslim district, where alms-giving is regarded as a religious duty and the provision of the opportunity for alms-giving is a social activity of the highest value. The members of this blind community are sent out to beg each day, and in the evening their takings are divided according to a complicated system of equity by a blind official whose title in the Hausa language may be roughly rendered as 'Chancellor of the Exchequer'.

It is not easy to break customs as well established as this; but the main reason why the blind of Africa are for the most part beggars is neither religious nor anthropological; it is simply that they are at present incapable of doing anything else. Already, the Royal Commonwealth Society for the Blind has succeeded in proving that it is perfectly possible to train them for normal occupations. From the first, the Society decided that it must not simply reproduce the educational arrangements made for the blind in advanced countries. Much time has been spent in adapting braille to African languages, but it is clear that literacy is not the most important goal for a blind African to pursue. It is much more valuable to try and fit him for the position which he would ordinarily occupy in the society to which he belongs.

This is why considerable effort has been spent on the establishment of rural training centres at which the blind can be taught to grow crops and tend cattle. One of the most successful of these centres is at Ikeja, near the Lagos airport. On this sixty-acre model farm, blind men are taught to grow cotton and sunhemp, cassava, yams, maize, groundnuts, paw-paws, okra, tomatoes, spinach, beans, lettuces, cucumbers, carrots, cocoyams, urena, pineapples and citrus fruits. Poultry, goats, sheep, rabbits and guinea-pigs are also kept. The centre is largely self-supporting, and its object is to teach blind men to farm their own smallholdings. Often their wives come to the centre as well.

When the training is over the trainees are

accompanied to their own villages by the centre's rehabilitation officer, Miss Grace Ingham, whose experience in the care of the African blind was first gained when she worked at a colony for the training and rehabilitation of blind lepers. Miss Ingham's reports make fascinating reading: very often she finds that the friends and relations of the blind trainees are either sceptical or even resentful of their newly acquired accomplishments. Sometimes the blind themselves, after a strenuous period of training, find it tempting to relax into idleness and dependence. What is astonishing, however, is that in general the trainees succeed in establishing themselves as successful farmers, and on the average their performance is said to be better than that of the ordinary products of the Government demonstration farming-centres. The training is neither long nor costly, and its effect on the morale and physical well-being of the blind men is remarkable. The trainees are carefully chosen, but there is every reason to suppose that many thousands of blind Africans could benefit from the training if the money were available to provide it generally.

Sometimes the results are little less than brilliant: Sylvanus, one of the products of Ikeja, now farms land four miles from his house; he gets there and back easily, and is about to enter a competition for the best-kept farm in the district.

The Ikeja centre has been in existence two years, during which time it has been run by the Royal Commonwealth Society for the Blind. It has now been handed over to the Nigerian Federal Government, though the Society will continue to support it in every way possible. As a gesture of appreciation, the Nigerian Government has ordered that the Union Jack shall continue to fly alongside the Nigerian flag over the centre.

Rural training is not, in itself, enough. As well as training in basketwork and other occupations suitable for the blind, it is important that they should, wherever possible, get normal primary education. Less than one per cent of the blind children of Africa go to school, and there is no chance of building enough special schools for them in a foreseeable time. In the Katsina



In most African territories fewer than one per cent of the blind children go to school. Nigeria has 20,000 blind children: hence the experiment in Katsina—to teach the blind and seeing together

district of Northern Nigeria an important experiment is now in progress. The blind are being admitted to ordinary primary schools, but a special body of itinerant teachers has been set up to supplement their teaching, where necessary, with expert instruction. It seems likely that this method, which has much to commend it on psychological as well as economic grounds, will spread to other parts of Africa.

The examples cited here have been taken from West Africa, but they are typical of the work going on throughout the continent and in many other parts of the Commonwealth. The first aim is to prevent and cure blindness. Experiments, notably in Kenya, have shown how much can be achieved in this respect by mobile clinics which can be established at an initial cost of £1000.

The fact is that an immense proportion of Africa's blind could have their sight restored, often by comparatively simple operations; or that in future generations sight could be saved by easy precautions at birth or in early childhood. These aims cannot, however, be achieved without a much larger expenditure than can at present be met. Under its blind Director, Mr John Wilson, the Royal Commonwealth Society for the Blind is marking its tenth anniversary by a determined attempt throughout the Commonwealth to awaken the public conscience to these facts, at once so sombre and so hopeful.

COLMAR SEEN AGAIN



Both photographs from the Mansell Collection

THE plain of Alsace is bounded on the east by the mud-grey Rhine, heavy with barges, and on the west by the Vosges, with vineyards and little towns in its foothills and deep valleys of green-black pine forests rising to highlands covered with blueberries and cranberries in the autumn and with snow in the winter. To the north is Strasbourg, and to the south Mulhouse. A third of the way up the plain lies Colmar, capital of the Department of the Haut-Rhin. It is a small town of just over 50,000 inhabitants, with as its centre a 'cathedral' (or so they call it) of brilliant

orange and red sandstone, a variation on Strasbourg's strawberry pink. In this, the collegiate church of St Martin, built between 1234 and 1300, is Martin Schongauer's masterpiece, *The Madonna of the Rose-bower*. Not far off, the convent of the Dominican Sisters, the Unterlinden, houses what is undoubtedly the most important single object in German painting, Grünewald's fabulous Isenheim altarpiece, of four wings each painted on both sides in brilliant colour, which has remained untouched by restoration. It contains the most mystic and

BY
**NICOLAS
POWELL**

Two of the nine panels of the 16th-century altarpiece by Matthias Grünewald, from the Antonite Monastery of Isenheim, now in the Unterlinden, Colmar. (*Opposite*) The temptation of St Antony; and (*right*) the Visit of St Paul to St Antony in the Desert

in many ways the most moving scenes in European art. Twice it has been miraculously preserved, first during the French Revolution, and secondly during World War II by a German official. These two paintings are the magnets that draw the student of art and the tourists, who linger in Colmar a day or only part of a day, and then hurry on north or south. They are the highlights of the romantic side of the old town with its twisting streets named after the various guilds: the Rue des Marchands, des Chasseurs, des Tanneurs, de la Poissonnerie. The last has kept

its name and its activity since the Middle Ages, with wooden cages full of carp set in the shallow green Lauch that runs sluggishly through the town and on towards Strasbourg.

But the ordinary traveller finds his pleasure in houses like the Maison des Têtes, with its famous restaurant, serving *coq au riesling*, or the little restaurant of Illhaeusern on the Ill, a few miles to the north, which is the best in the whole region; for good food is also one of Colmar's attractions. From the nearby valley of Munster comes the famous soft camembert type of cheese,





The Mansell Collection

The Madonna of the Rose-bower (1473), by Martin Schongauer

with its pungent and penetrating farmyard smell and taste. *Pâtés de foie gras* are no longer made at home, in the farmhouses around the town, but come mostly from Strasbourg, and even then the livers used are imported to a great extent from Hungary. These, and the cherry and strawberry tarts, the chickens and asparagus of the plain, are accompanied by Alsatian wines, for Colmar is the centre of Alsatian wine production. There are also four *eaux de vie*: Kirsch made from cherries, Mirabelle and Quetsche from mirabelle

plums and damsons, and the most elusive of all, Framboise, distilled from wild raspberries, for which there is now little labour to be found for the picking; if genuine, Framboise now comes only privately from farmers whose tall white bottles have a stamp-paper label.

But the romantic aspects of Colmar and its surrounding villages conceal a most remarkable spirit of change.

Colmar was a Free City in the Middle Ages, and became French in 1648 under the Treaty of Westphalia, whereas Strasbourg itself did not become French until 1681. Colmar was a judicial centre, and on the removal of the king's representative to Strasbourg it remained so and is still the seat of the Court of Appeal for Alsace.

The population of Colmar was 13,296 in 1801. In 1871 it was 22,311, and by 1913 it had doubled to about 46,000. This was because of the increased textile industry, principally dyeing, cotton, wool, jute and silk mills, in the area of the town. Originally these mills had been in the valleys and on a small scale; but there and up in the Vosges, rural life is too difficult for modern tastes, the farms are too small, the work too arduous and the methods too old-fashioned, and Colmar as a result is now becoming an important industrial centre. Houses are being built at the rate of 500 a year, and it is intended to have accommodation for 30,000 more

workers. Apart from the textiles, with eighty-one factories and 15,000 workers, there are smaller paper and wood industries, and in addition there are mineral-water, sauerkraut, cheese, noodle, liqueur and vinegar factories. But there are other factors which point to an increasingly prosperous future for Colmar.

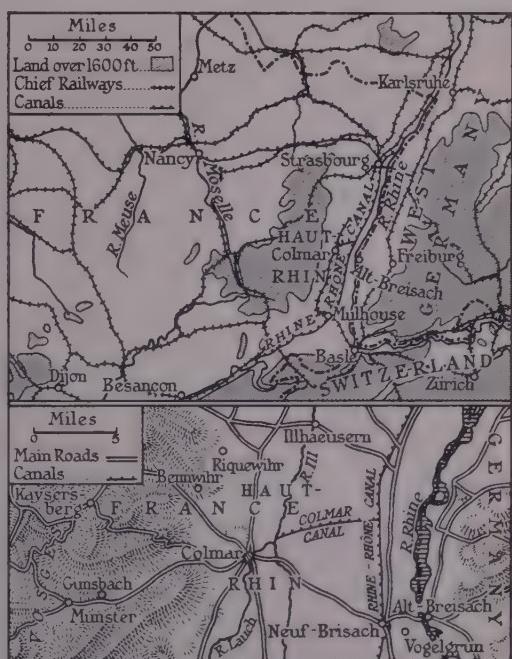
That future is bound up with the Common Market. Colmar lies ten miles or so from the Rhine, and here by Neuf-Brisach there is a major road crossing the river from Freiburg in

Germany, which has just been wisely connected with Colmar by a wide new road. Near this crossing is the meeting-point of the Rhine itself and the parallel Grand Canal d'Alsace from Basle, and through Neuf-Brisach passes the Rhine-Rhône Canal. As part of their scheme for the exploitation of the Rhine, the Electricité de France have recently built a large power station at Vogelgrun, beyond Neuf-Brisach, one of several along the Rhine. There are vast power sluices for the barge traffic, for Strasbourg, forty-five miles downstream, is the sixth port in France. This immense enterprise at Vogelgrun lies in a sweep of concrete and lawn astride the main road from Germany. Alongside the power station the city of Colmar has started a port with over 800 yards of quays. It is still in the process of building, but is already used, for instance, for a valuable if small export of gravel to Holland. There is a silo for 10,000 tons of grain and there is to be a *chai* or warehouse for wines—not for those of Alsace especially but from France generally—which will handle between 330,000 and 440,000 gallons. Industry is to be encouraged, but only of a sort that requires the proximity of the Rhine harbour. An area on a promontory has been reserved for tourism: there is provision for a hotel, a yacht-harbour, camping and a heliport.

The production of wine is an important industry around Colmar; about 15,000,000 gallons were produced in 1959, of which nearly 500,000 gallons were exported—a tenth of it to Great Britain—bringing a useful revenue of 632,000,000 old francs (about £460,000) to Alsace. All Alsatian wine is white. Between 1871 and 1918 the quality was neglected; these were also the years of phylloxera. The Germans permitted the addition of sugar to the wines and the vines were allowed to deteriorate into hybrids for ordinary table wines. Now the vintners are trying to produce only the Sylvaner, slightly earthy, sometimes sparkling; the Riesling, a fine dry wine, spicy and with a touch of Muscat; the Muscat itself; the white Pinot Blanc which has been produced for ages in Alsace; and, finest of all, Gewurztraminer, which has the finest bouquet of any in the world, brimming with a raisin sweetness in the glass, with a scent of a full-blown rose. It is this and the Riesling that have made the fame of Alsatian wines.

The vineyards are mostly small. Riquewihr, the most important wine town in the neighbourhood, with just under 2000 inhabitants, has only five owners with more than twelve acres, nine

with five to twelve acres, and 386 with less than five acres. The last-named owners work the vineyards part time, either farming or carrying on some other trade as well. There are eleven wine cooperatives in Alsace to help market the smaller vineyard products. Some villages own such cooperatives, and four of these are within a few miles of Colmar. Colmar itself has an important cooperative with, in addition, a considerable production of grape and apple juice. By now the process of improving the quality of the vines has proceeded so far that a third of the vines produce *vins nobles* (of the varieties mentioned above). Nearly half of these wines are sold outside Alsace and 7 per cent of this is exported abroad. The largest firm in Riquewihr, with only 124 acres of its own, has fifty-five glass-lined cisterns in its cellars and produces 2,000,000 bottles of wine a year, a quarter being for export. The extra grapes are bought locally and pressed on their premises. The grapes are pressed three times, the first pressing producing the best wine. Wine is also made by the champagne process in this large concern, mostly for export to England. They employ 150 people, and double that number at the harvest; but local labour for the vineyards, and for the forests, is hard to get, as people—here as elsewhere—are leaving the land for industry.



A. J. Thornton



(Left) Workmen washing out barrels in the yard of the largest wine producers in Riquewihr, the most important wine town in the district.
(Below) Kaysersberg, another wine village in the Vosges near Colmar.
(Opposite) The Maison des Têtes at Colmar, dated 1609, so called from all the heads that adorn its façade.

Association départementale du tourisme du Haut-Rhin





Colmar has an important wine fair in August, and it is also the seat of the Association of Alsatian wine-growers. The great feature of the Alsatian wine is that it is the only wine in France named after the variety of the grape, and it is not usually blended. Like its cousins the Hock and Moselle wines, it can be drunk very young, at most two or three years after harvesting. It is interesting that the local consumption of red wines is so high as to be a serious social problem;

One of the statues by F. A. Bartholdi (1834-1904) in his native town is the delightful *petit vigneron* sitting drinking while his spitz watches at his feet

the author



nevertheless it is obvious that the white wines have an important place in the tourist industry, which is itself officially considered highly important.

All this sounds matter-of-fact and statistical, but it underlines the truth that this charming quiet town, which someone suggested was 'the truffle in the *foie gras*', is at a point of decision.

And what of the town itself, with its view across the bridges to lilac-lined gardens and the eaves of timbered houses backing onto 'little Venice'? Apart from the twisted mediaeval streets, the 'cathedral' and the Dominican church, there is a municipal theatre, small but highly decorative, with visiting companies from the Strasbourg Opera and the Comédie Française, and even Jean Marais. There is a fine old municipal library in the Dominican monastery which has been recently modernized. There is one of the most up-to-date hospitals in France, completed just before the war, with an important radiological department. In addition to its *lycées* and *collège technique* (the grammar and secondary modern schools), it is going to build a *cité technique*, to contain among other departments a national School of Commercial Textile Sales. The Champ de Mars, a symmetrical park, has at one end F. A. Bartholdi's statue of General Rapp and at the other the Prefecture built in 1865 under the Second Empire. The railway station was built in 1903 under the first German occupation. Indeed, it is the only sign of that unwelcome interlude, just as the statue of Admiral Bruat, also by Bartholdi, being restored to its position, is the only reminder in Colmar itself of the second occupation. (In the country round about, however, complete villages like Bennwihr were ruined in the fight for the Colmar pocket in 1945.)

Bartholdi, sculptor of the Statue of Liberty in New York harbour and the Lion of Belfort, was a native of Colmar. The house in which he was born is now the best sort of museum, filled with furniture from his Paris apartment (and pretty startling some of it is) and with casts and maquettes of his works. It is quiet and peaceful, but far from neglected. Only when one counts the unending models in it does one realize that a large part of the municipal sculpture in France would appear to be by him. He died not sixty years ago, in 1904, and we probably live too close to him to see that he was in fact a very considerable artist in the academic style. An even greater local figure is still living, for Albert



All Kodachromes by Nicolas Powell

The band of the Fire Brigade as it parades through the streets of Colmar during the Fête de la Libération, on St Joan of Arc's day, May 8, when France's deliverance from German occupation at the end of World War II is celebrated. The military parades held on this occasion are surpassed in splendour only by those of July 14





(Opposite) The Rue des Boulangers, the busiest street in Colmar, looking towards the spire of the collegiate church of St Martin, which the inhabitants of Colmar call their cathedral.
(Above) The Rue de la Poissonnerie, beside the River Lauch. From the carp-cages in the river fishmongers collect the carp fresh for their customers as they have done since the Middle Ages

Schweitzer was born in the Munster valley at Gunsbach about twelve miles away.

So, despite the changes, much remains the same. In Riquewihr the boys still lead the horses to drink in the rose-coloured stone troughs in sight of the Dolder, a watch tower and gatehouse built in 1291. The fishmongers of Colmar still keep their carp in the wooden tanks as they did in the same place and the same way many centuries ago. All that has really changed is the cars full of tourists, and they are welcomed by the illuminated churches and towers of the townships on the *Route des Vins*. Along the crest of the hills the *Route des Crêtes* is blue, not with the mountain mists but with exhaust smoke.

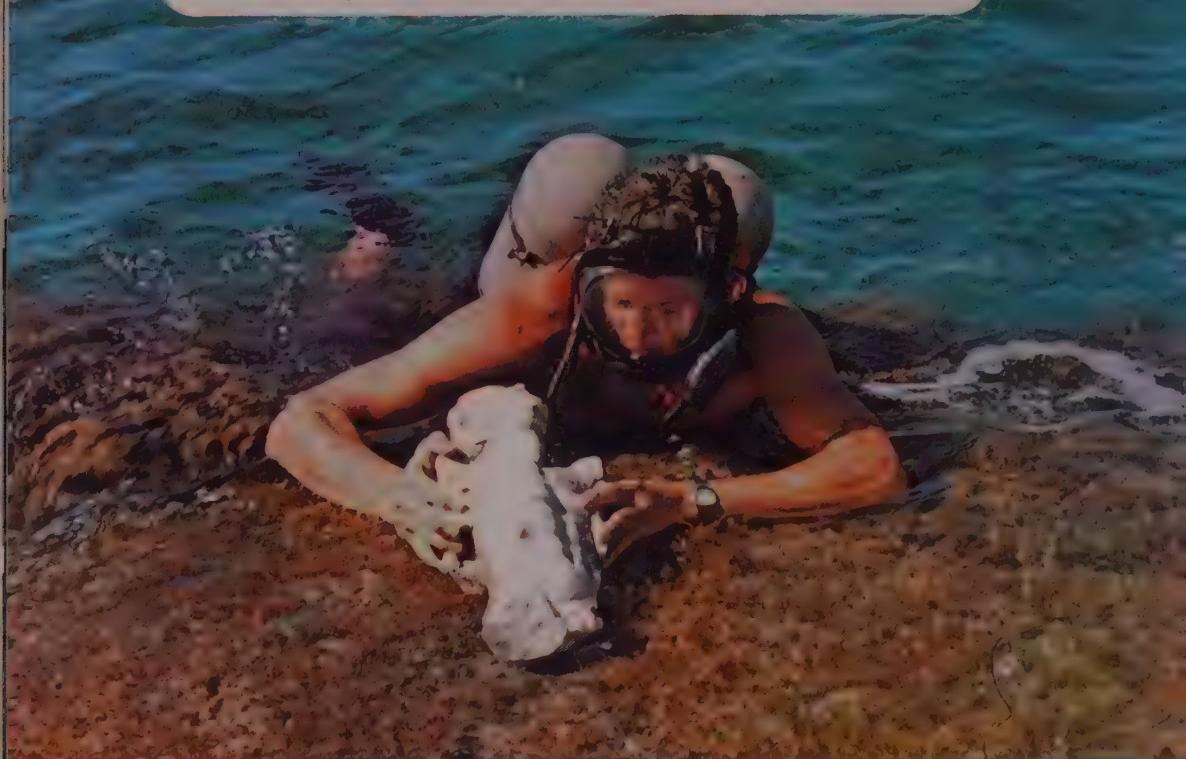
The young children at school learn French where their fathers in some cases and their grandfathers certainly learnt German. Some families have always spoken French, some

farmers and tradesmen always Alsatian. Alsatian, though written in High German, is spoken in the surroundings with an accent which is nearer to Swiss German than to the German spoken on the other side of the Rhine.

The Isenheim altar has been described as 'that pilgrimage in art which every cultured person should have made at least once in his life'. But I think of Colmar too as the culmination of a long day's skiing down the Munster valley; skimming past the dark pine trees, down to the lights of a village; or, in later spring, I sit again in the meadows among the trees, looking down beyond Colmar to the strip of silver of the Rhine, for once not lost in mist, over the tops of thousand upon thousand of cherry trees, puffs of white smoke down the slopes across the plain to the vineyards; and at my feet giant butter-coloured cowslips, yellowing the hayfields as far as the eye can see.

Apollonia Revisited

by NICHOLAS FLEMMING



All photographs from the Cambridge Apollonia Expedition

Kodachrome

In February 1959 we published an account of the work of a Cambridge Expedition which went to explore and survey the half-submerged city of Apollonia on the Libyan coast. This article continues the story. (Above) Among their finds was a marble statue in a Roman fish tank

I NEVER thought that I would see Apollonia again. After four weeks of hectic work there in 1958, burnt by the African sun, cut by the twisted rocks, cooled by the calm green depths of the sea, I returned to England with maps, photographs and a confusion of memories. During that winter we worked over the results of the expedition and were irritated to find that the deductions we made from our map would need further field-work to confirm them, but we made no definite plans to return. Only a few weeks before leaving for Sicily in July 1959 did I get the opportunity to arrange a second visit to North Africa, and then only as a result of the generosity of the Royal Geographical Society,

the British Academy and *The Geographical Magazine Trust Fund* could I carry it out.

On the morning of September 3 the twin domes of the Cathedral of Benghazi crystallized out of the early mist on the horizon, and we carried our gear on deck for unloading. There was a small compressor, an outboard motor, four aqualungs, two underwater cameras (one still, one ciné) and a mass of personal equipment and odds and ends. We had no boat of our own, but one of the sailors on board assured us that his friend Nino of the *Fleccis Nero* would be in Benghazi and would be delighted to lend us a dinghy, so I gave him a large bottle of Marsala and hoped that this would help him to find Nino. We had just

got the equipment through the customs and onto a donkey cart when the sailor arrived with Nino, so Martin and Johnny Minns, Hugh Edwards and John Dick went with the cart to the hotel, while Natalka Czartoryska and I set off to the *Flechis Nero*.

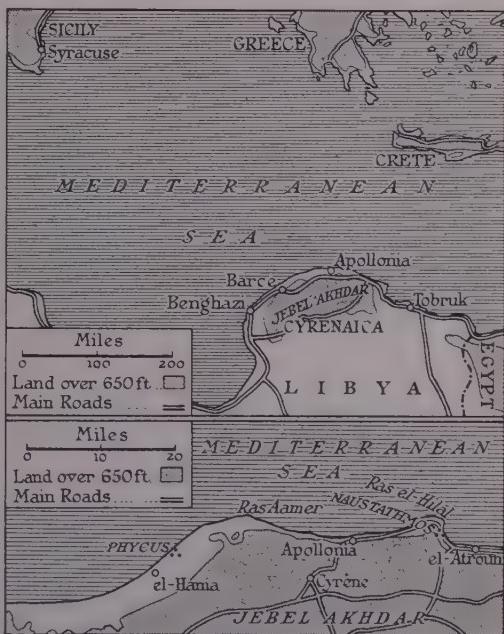
We walked round the dockyard, past red-hatted Arabs and Negroes sitting on the kerb, looking for a suitable dinghy. Nino said he had several for us to choose from. His ship was dramatically painted in black, green, white and red, with the ever-open lucky eye of Syracuse watching over the bows. He showed us a dinghy, ordered two of his men to get it out of the water, produced oars, anchor, ropes and cork floats, and then introduced us to his Arab partner. I said I would be back as soon as possible with a truck to take the dinghy to Apollonia, which is 150 miles east of Benghazi. While I went off to find transport, Natalka went to the Department of Education, where they kindly agreed to lend us an unused building in Apollonia, not too far from the sea. The Royal Army Service Corps told me that they had a patrol of two Land-Rovers and a 3-tonner going east the next day, and that they could take the dinghy and one or two people but not all the gear. When I returned to the hotel Martin said that Richard Goodchild, the Director of Antiquities in Cyrenaica, had met him in the street and had taken Johnny and Natalka with him so that they could get the house in order before our arrival. Martin and Hugh then found an Arab bus, and set off with the remaining equipment except the dinghy, while I stayed in Benghazi.

That evening I sat at a café in the square calculating the odds on getting any useful work done in only ten days at Apollonia so late in the season. We were committed to make a map of Phycus, to confirm the positions of the moles around Apollonia, to do a plan of the fish tanks, and to find and identify Naustathmos; and all this in so short a time with only a slight chance of good conditions. I increased my optimism with canned beer and went to bed late.

The army lorry arrived next morning and I went with it to the dockyard, where Nino had some hands ready to load up the dinghy. His partner seemed so upset by the sight of a military truck that I was afraid that he was going to prevent our leaving, but we pacified him and escaped. As we left the dock gates the driver told me that the two Land-Rovers had gone on ahead and would meet us at the café by the

Turkish fort where the road climbs up to the Jebel Akhdar. At the café, we met and had a long cool drink on the terrace, looking out over the red coastal plains towards the palm trees and lagoons around Benghazi. We drove uneventfully through Barce and Cyrene, arriving at Apollonia in the early evening, where to the west we saw range upon range of hills, their outline blurred by the glare of the low sun.

Work started early next morning. Martin was continuing the detailed measurements of the submerged *piscina loculata*, his pet task. The *piscina loculata* is a fish pool divided into compartments, which contain varieties of fish and are connected by channels with sluice gates. Continuous circulation of fresh sea-water is arranged by synchronizing the opening and shutting of the main sluice gates with the small Mediterranean tide. The tank was cut out of the solid rock at the foot of the Acropolis, so that, diving from the rock platform at the water's edge, one plunged straight down to the bottom of the pool, where the dividing walls could be seen projecting from the sand and rubble. The water was about ten feet deep here, and so clear and still that Martin could work for many hours without an aqualung, measuring and writing on a board the minute details of the tank's construction. Hugh also went to the extreme eastern end of the city, where he was searching for



A. J. Thornton



(Above) The Byzantine palace found at Apollonia by the Director of Antiquities of Cyrenaica.
(Below) From this ledge the rock plunges sheer to the bottom of the submerged Roman fish tank



evidence of the building of a sea wall, while John and Johnny took the dinghy to make depth measurements all over the site.

Natalka and I walked down to collect 'the Army', who were still asleep. They eventually turned up, and, although the sun was uncomfortably bright, were ready to go to the ruined city of Phycus. The track along the coast meandered between thorn bushes and had no surfacing. Sometimes it was red dust, sometimes rough stones, sometimes jagged ribs of solid rock, but it was always uncomfortable. We jolted westwards at a steady 10 m.p.h. until we reached Ras Aamer at mid-morning, where we found a team of Arab divers at work on the remains of a war-time wreck which they had started to cut up the year before. The wreck lay against the rocks in thirty feet of water and the waves broke slowly over it, disappearing into the gaping holes in the deck to reappear as great plumes of spray. The divers used standard gear, a hand pump and oxy-acetylene cutters.

After we had had the ritual cup of tea we continued our journey, taking with us one of the Arabs, who wished to collect drinking water in a jerry-can. We had only driven a quarter of a mile when the Arab stopped us and said that here he would get water. We looked around us. On one side the dusty slabs of stone stretched to the sea, on the other to the bare brown foothills of the Jebel. Here and there were scraps of thorn bush. The Arab had jumped off the jeep and was walking quickly towards the sea. We followed him with curiosity. A hundred yards from the sea shore he crouched down and then disappeared into a hole in the ground. We ran to the spot to find a three-foot-wide hole in the solid rock with a tree-trunk leaning against its lip to form a rough ladder. I climbed down into the darkness and arrived on a smooth ledge from where I could look across the cavern some forty feet, and a further fifteen feet to the bottom. As I descended by means of notches in the rock, I found that the hand- and foot-holds were white and polished like religious relics which have been touched by centuries of pilgrims. The cave had a sandy floor and was lit by several breaks in the roof through which the sun shone blindingly. The floor and roof both sloped towards the sea, and in the farthest and darkest corner there was a shallow glimmering pool of fresh water. The Arab submerged his can in the pool, and the gurgling bubbles echoed around the cave and died away as water rushed in. We climbed back

into the sunlight, waved farewell to our friend, and continued our way to Phycus.

Shortly before midday we reached a stretch of the coast where a line of small dome-shaped hills bordered the sea, with bays between them. Connected to one of these hills by a low col was a second hill directly inland from it, which we saw to be covered with tombs cut into the rock. We drove the jeeps out onto the headland formed by the seaward hill, the wheels spinning as we climbed crabwise up the soft sand slopes. We came to a stop on the crest of the hill and looked across walls and bits of column which scattered the slopes, out towards the rocky shore which was honeycombed with tunnels and tombs. We jumped out of our seats, took pencils and pads, and started to draw rough plans of the hill and the buildings on it. For us the most important part was the shore itself and here we found a submerged shelf fringing the headland, only about two feet underwater, and with depressions about ten feet deep incised in it, connected to the open sea by narrow channels. The rocks were about thirty feet high and a series of broad

The author descending into a deep cave near Ras Aamer from which the Arab divers collect their fresh water





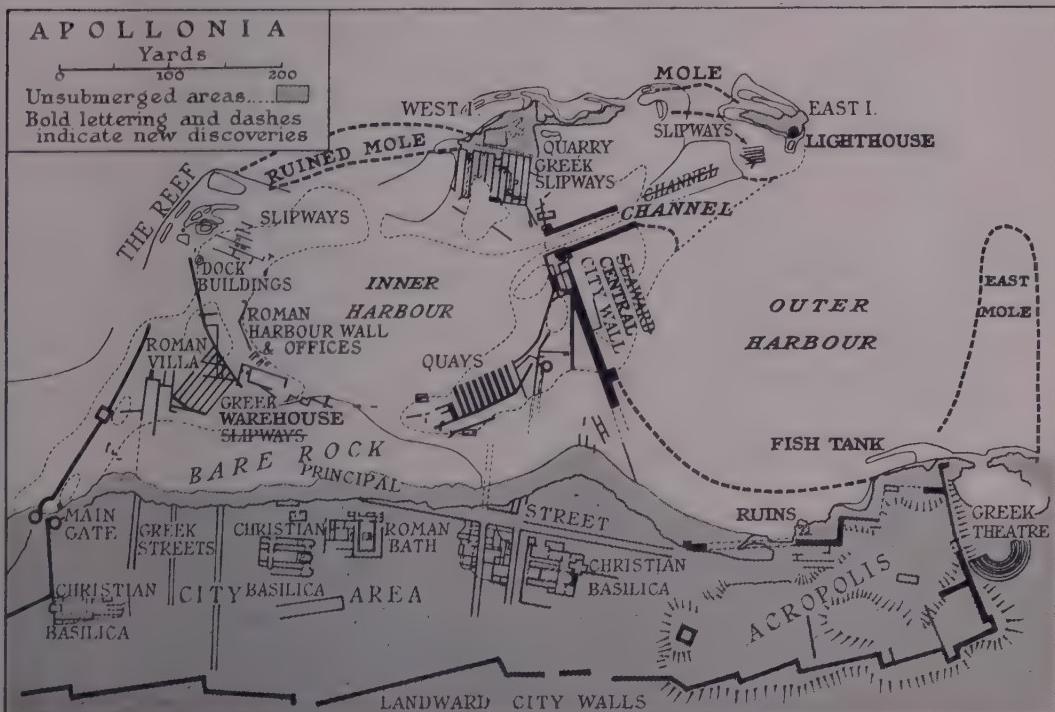
The East Island has been quarried on every side and all its surfaces are man-made, forming cliffs which are so steep that only in the calmest of weather is it possible to climb them. The circular platform at its eastern end is supported by a solid rock buttress which overhangs the water, and which, in Roman times, supported a fortified lighthouse to protect the entrance to Apollonia's outer harbour. (Right) A Roman lead ballast weight is brought ashore near East Island. (Opposite) The Expedition's revised plan, with their latest discoveries



straight-sided cuts had been made through them, with the flat floor almost like a roadway and just submerged. From these 'roadways' doors and steps led into tomb chambers, each with alcoves in its walls. In places, where the rock rose only ten feet above the water, we found evidence of superimposed cutting of channels, tunnels and storage tanks, since one cutting would sometimes slice right through another. Many of these chambers seemed to have been filled up with concrete, but closer investigation showed that it was probably a natural formation of rock composed of blown sand and chemicals from the sea, welded together by evaporation. The whole network of tanks probably formed a storage depot for oil, fresh water, grain, fish, oysters, crayfish and so on for supplying the ships which called at Phycus in the Byzantine period in the 5th and 6th centuries A.D., but many of the features that we found still defy explanation. We swam all round the headland, tracing the seaward limits of the walls of the tanks, collected a few pieces of amphorae and left in the early evening, driving through the decaying village of el-Hania, then climbed to the Jebel and returned to Apollonia by the mountain road.

We were outrageously lucky. For the next few

days a gentle easterly wind blew, so soft that it did not stir the water to cloudiness, but sufficient to cause a steady movement of sand from the eastern limits of the ruins of Apollonia onto the part that we had previously mapped. The result was that many ruins were revealed in the area of the city that we knew least about, and we worked there furiously for fear that the conditions would change. We discovered a continuous band of rubble projecting from the sandy bottom in a depth of thirty feet leading out to sea from the Acropolis almost to the East Island. At the outermost end there were many enormous rectangular blocks of stone littered about the bottom, with smaller blocks of white marble between them. Knowing that the Greeks were quite capable of building a sea wall in this depth, we concluded that there had been a mole here enclosing a second harbour, and that there had been a massive tower at the end of it. Although the gap between West and East Islands was quite deep enough for a channel, there was so much rubble lying at the bottom that it seemed that this too had originally been blocked up, and that the real entrance to the port had been between East Island and this eastern mole. Hugh swore that the gap between the islands



had been blocked and was less than twenty feet deep. He was so sure of this that he volunteered to be tied by twenty feet of rope to a large rock and dropped over the side without an aqualung. Luckily we checked the depth first and found it to be twenty-five feet; but clearly it had not been used as the channel.

Before we had left England, Sir Mortimer Wheeler had examined our 1958 map, and had suggested that we look on the East Island for the remains of a lighthouse. The sides of the island were all artificially cut and plumb vertical, so that it was very difficult to land. Martin climbed the cliff with a rope and hauled up the cameras and surveying instruments from the boat. On the top we found a huge circular foundation partly of blocks, part cut from the solid rock, which overhung the cliff like a bay-window on the landward side: the lighthouse had been here. In the depths of water towards the Acropolis we could just distinguish the dark shadow which marked the end of the east mole. This surely was the true entrance to the port of Apollonia.

After the success of finding the lighthouse we decided that it was time to search to the eastward for Naustathmos. Mr Goodchild offered us a lift in his truck, and a few hours later we were rolling down the last hill by Ras el-Hilal to the sandy shores of a sweeping bay which rivalled Naples for beauty. By a fresh-water spring we found an old Arab tending his flock of goats, and a few yards inland from the spring were the foundations of old buildings and great blocks of stone. The naval chart of the area marks a 'Roman Jetty' near the spring, but close investigation by diving all round the supposed jetty showed it to be a natural feature of horizontally bedded stone, which had been eroded by the sea into blocks which looked as if they were man-made. When we sat down to lunch we were surprised to find that Hugh, who was always ready to eat, was nowhere around. He had last been seen swimming quite a way out in the bay looking for amphorae, but the sea was now quite smooth and empty, and since there was no point in trying to search the vast area in which we thought he might be, we continued with our meal. Over an hour later we climbed a short way up the hill, struggling through the prickly bushes, to obtain a better view across the bay, particularly towards the headland of Ras el-Hilal, to which it was possible that Hugh had been swimming. The water was calm, blue, undisturbed and unhelpful. I sat down and waited; then after a while I

saw a small figure coming slowly down the track, walking painfully on the hot sharp stones. I screwed my eyes up against the glare of the sun and saw Hugh, barefoot and carrying his fins. He explained sheepishly that he had swum across the bay by mistake while looking for amphorae, and had then decided to walk back: he wished that he had swum back again.

By this time we had done everything we could at Naustathmos, so we drove on to el-Atroun, the Roman Erythrium, donned aqualungs again and searched the water near some ruins. The coast here was of high cliffs of jointed limestone, which were carved into beautiful arches and grottoes by the sea. There was a small stream which reached the sea by a narrow gully, bordered with scarlet depositions of tufa, and the fresh water was far colder than the sea. As I swam past the entrance of the stream I passed through patches of warm and cold water, and then the visibility became hazy. Shimmering clouds distorted the rocks and the fish into grotesque ever-changing mirage forms. I swam further along the foot of the cliff, searching the weed-covered rocks for any signs of cut stones or pottery, and suddenly hit another patch of ice-cold water. I traced the source of the fresh water to a pothole deep in the base of the cliff, and later found other springs of the same kind. In the next inlet we found a few broken shards, but the sun was setting and the air was becoming cooler and we had had enough for one day. We climbed the cliff path in the cold stillness of the evening light, threw our wet swimming gear into the back of the truck and sped back along the winding road towards the sunset and Apollonia.

There were only two days to go. We had achieved all we had set out to do except for finding ruins on the island chain immediately to the west of Apollonia. And still the weather held. Hugh and John spent a morning swimming from island to island down the coast, while the sun rose vertically into the clear sky, and they had to return, defeated, across the scorched red earth. As if to compensate for this unlucky start to the day, the afternoon provided a succession of surprises. Natalka, Martin and I were filming the ship sheds by the tunnel in the grotto reef, while Johnny was sounding depths from the dinghy

(Opposite) At a time when he was not wearing an aqua-lung, one of the team discovered a Greek stone anchor under water, near the quays in the inner harbour. He struggled to the shore with it along the bottom, dropping it and surfacing whenever he needed to breathe



and John was completing the measurements of the lighthouse foundations. Hugh was nowhere to be seen. By mid-afternoon we finished filming and swam back to the shore, where we found that Hugh had just emerged from the water. He was sitting on a small square stone, looking very pleased with himself.

'What have you been doing?' I asked abruptly. I was irritated because I felt that he had been slacking, but I knew that he must have found something exciting, so I tried to conceal my feelings. He jumped up from his seat, revealing it to be a wedge-shaped chunk of sandstone with three large holes cut in it.

'Just look at this, boys!' he shouted. 'The finest Greek anchor you ever saw. It's better than any we found in Sicily. An absolute beaut.'

'Where on earth did you find it?' I asked.

I was just cruising along by the little square building near the quays when I saw the corner of a stone sticking out of the sand. It had a hole drilled in it, so I guessed what it was. It was only ten feet down so I went and got it out. It was a honey. The trouble was it was so goddam heavy that I couldn't swim with it and had to walk along the bottom, dump it, come up for a breath, and then go down and get it again. I'm shattered.'

'Too bad,' I said; 'shattered or not, you're going to do it all over again for the cameras. It'll make the funniest picture for years.'

We whistled for the dinghy, and Johnny rowed it over. I was getting into the boat when Johnny prodded me and said in a hurt voice:

'Haven't you noticed anything?' I was puzzled. 'This,' he said, and triumphantly held up a slab of lead with a slot in it. 'A Roman ballast weight. The plumb-line landed slap on it. I was looking to see that the line was straight, and there it was. Too easy. Isn't it nasty?' (Nasty in Johnny's private language means excellent.) This was a wonderful find, but Johnny was cheated of his glory by the excitement over Hugh's anchor, and we dumped everything into the boat. Sure enough, Hugh struggling along the bottom clutching the great lump of stone was a splendid sight, but he found it too tiring to be funny.

In the evening Natalda and I were measuring some foundations which had just been uncovered by the sand in the surf zone, and we returned to the house to find the others already sitting down to start dinner—fish of course. I was sitting down myself when Martin got up, walked to the corner of the room and said dramatically:

'Hugh has done it again. Meet our new friend.' He pulled a towel off a heap of junk, and there was the gleaming white marble torso and head of a laughing faun. I was too surprised to say anything, so Martin provided the details. Hugh had been helping him finish off in the fish tank and had seen the head of the statue amongst some rubble in the shade of a large boulder. That was all there was to it. We drank to the success of Hugh's wonderful eyesight, and felt very pleased with ourselves. But our luck had not finished.

After dinner a friend of ours, the Arab school-teacher, came in to say that he had found something that might interest us, and had we got a pencil and paper. We provided him with a large sheet of paper, and he drew a map of Apollonia and the islands near by, and explained that he and some friends had been swimming, and on one island had found masses of ruin which disappeared into the water on all sides. He paused awkwardly, as if he was afraid that we might not be interested. I assured him that this was marvellous news, that we were extremely grateful to him, and I promised to mention his name when I wrote about Apollonia. This pleased him wonderfully. Unfortunately I lost the scrap of paper on which he wrote his name, so I must here apologize to him. The next day we were due to leave, and I had agreed with the corporal of the army patrol that I would ring up and confirm when I wanted transport; but first thing in the morning we drove along to the school-teacher's new island, and Martin took a camera in an underwater case, drawing-boards, pencil and ranging poles and swam over to it, while the rest of us returned to base to pack.

At eleven o'clock that night we said good-bye to all our friends who had helped us so much, and the lorry chugged up the steep hill to Cyrene on the Jebel. I woke the next morning at sunrise. I listened to the roar of the tyres on the road and the rush of sound as we passed trees and low walls. Dark branches flashed overhead across pale sky and the heavy lorry swayed rhythmically on the corners. Soon I sat up and saw that we were skimming along the flat road into the suburbs of Benghazi. The sun was up, and animals and people were already moving about in the long shadows of the palm trees. The throb of the engine died at last outside the dock gates. We uncoiled stiffly and climbed down: our African adventure was over. All that remained was the drawn-out anticlimax of the journey home.

The Family Life of the Pink-Backed Pelican

by PETER HILL



All photographs by the author

TWELVE miles inland from the Kenya shore of Lake Victoria, Pink-backed pelicans come each year to breed. A hundred or more pairs make untidy nests along the branches of a tall tree—so tall that I have never been able to reach a spray of its leaves to have it identified.

The birds start to arrive in October. Once all suitable branches are occupied, late arrivals overflow onto a nearby fig tree. In this we were lucky, for the fig was one of a group of three and the other two were sufficiently close to serve as vantage-points for photography. In each we built ladders up to a platform some sixty feet high. At this height we were roughly level with a group of three pelican families whose life and habits my wife and I observed and photographed over the next three months.

Ordinary bird books, particularly those on African birds, contain little beyond a brief description of the Pink-backed pelican, its food and type of nest. They tell us that it is smaller than the White pelican; that it is peculiar to Africa and the adjacent islands; that it is a greyish-white bird with a distinctly wine-coloured

back and rump; that it nests in trees, bushes or even on the ground, fishes singly or in parties, lays two to four pale blue or white chalky eggs, and that nothing is known of its call beyond clacking guttural conversation.

To these bare facts we wanted to add some detail. We wanted to know, among other things, how long the eggs were incubated; whether the cock bird incubated as well as the hen; how the incubating birds fed; how the young birds were fed and how often; the number of weeks the young remained in or, more correctly, on the nest; what calls the pelicans made; and why they chose this particular place.

Pelicans, singly or in parties, are seen on most lakes in Kenya but there are only three other places in which breeding colonies are recorded, all of them several hundred miles away. The White pelican, *Pelecanus onocrotalus*, which is distributed over south-east Europe, Asia and Africa, is known to breed only on Lake Rudolf in northern Kenya. The Pink-backed pelican, *Pelecanus rufescens*, has been recorded as breeding only on the Tana River in eastern Kenya and at



Lamu on the coast. But, though unrecorded, the colony of Pink-backed pelicans where we made our observations has been known for many years to government officers working in that part of the African Reserve; and the local inhabitants, the Luo, can remember no time when the birds did not nest in the big tree.

At first we found some confusion when discussing the birds, for the Luo spoke Kiswahili but used the Luo word *mbusi*, which in Kiswahili means goat, to describe the pelicans. In Kiswahili we were limited to *mwari* which, as well as meaning pelican, also refers to a boy or girl during initiation rites, a virgin, or a tongue of fire. Or we could use, as we usually did, the more cumbersome 'kitchen-Swahili' word which translates as 'the bird-owner-of-the-very-big-beak'.

The Luo attached a mysterious significance to

the presence of the birds each breeding season and we were told that the local Chief had planted some eucalyptus gum trees near the main tree as an alternative nesting place should the great tree ever die or be blown down.

As the pelican's diet is mainly fish, a nesting-site twelve miles inland meant a return journey of at least twenty-four miles for every bit of food brought to their young. Those that we saw fishing were mostly far out on Lake Victoria, so one can say that the return trip on average was much nearer thirty miles than twenty-four. Why over all these years had they used this site so far from their feeding-grounds? I can only assume that experience had shown this tree to be a safer breeding-place than any others nearer the lake. All this lakeside area is closely settled and there are few great trees left standing. This particular one had no branches lower than about twenty feet, so it was virtually unclimbable. Moreover, in a hollow in the main trunk just below the lowest branches there was a great swarm of bees, which was probably as regular a feature as the pelicans. The African bee is a very fierce insect which regards attack as the best form

of defence. I can think of no better protection.

It seems that the pelicans will continue to use the same breeding-site year after year providing they are not disturbed. This was borne out by the remains of an old nest on one of the fig trees which we used as an observation-point. It was easily climbable and I asked one of the Luo why pelicans no longer nested there. He told me that the last time a nest had been built the eggs had been stolen—not, he emphasized, by any local people—and no pelicans had nested there since.

In East Africa, where there is little change of seasons and no appreciable difference in the length of daylight to regulate the breeding-cycle, birds are often much less ordered in their nesting-habits than in the more temperate countries, where one can say within ten or fourteen days at what time of the year birds of a particular species

(Opposite) Pink-backed pelicans in Kenya, on a wild fig tree.
(Below) A vast colony of them has come every year within memory
to nest in a large unidentified tree and on the surrounding figs





(Opposite) A pelican guarding its chicks.
(Above, right) The young are fed only once a day, on fish which their parents bring from Lake Victoria, twelve miles away, carrying it in their crop. Here a young pelican pokes its beak into its parent's pouch, begging for food—but the young birds do not feed out of the pouch, as is often thought; the food is stored in their parent's gullet, into which the youngster (below, right) avidly thrusts its head





A fledgling pelican tests its untried wings in preparation for its first attempts at flight

will all start to nest. Here some birds breed in almost any month of the year, while others confine themselves to the short rains (November–December) or the long rains (April–June). These pelicans only breed once a year, during the short rains; but the other two records refer to breeding in May, during the long rains, on the Tana River, and in August, between the long and the short rains, at Lamu on the coast.

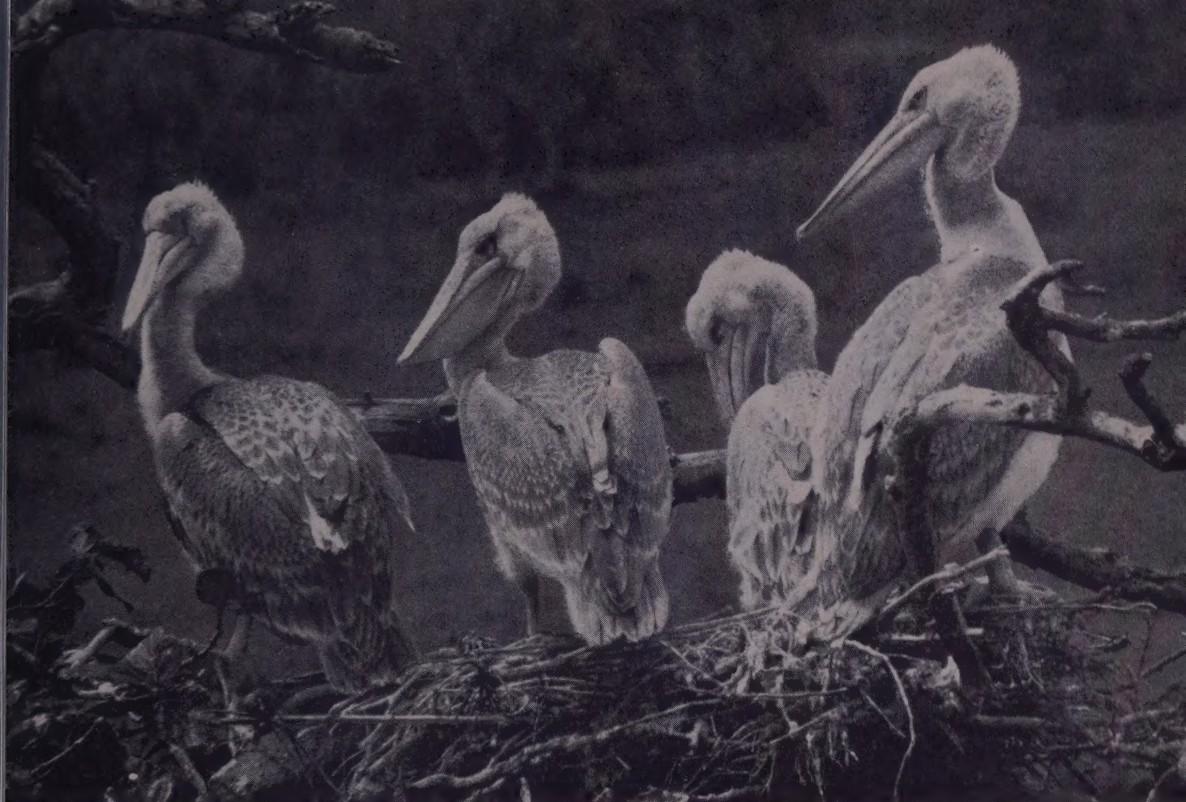
Our observations were greatly helped by the fact that some pelicans in the colony started laying as much as two months later than others. Consequently, on a single visit we might see newly hatched chicks, naked and helpless; active down-covered nestlings, raucously calling for food; and fully fledged youngsters stretching wings to a span of five feet or more in preparation for their first attempts at flight.

On December 28, when the platform and the ladders leading up to it were finally completed, one of the three pelicans in direct view had just hatched her clutch of three eggs and the other two were still incubating. On our second visit on January 10 a second lot, two only, had hatched out. As their newly born nakedness had already been covered by white down we estimated that

they were about seven days old. But the third clutch did not hatch until the end of January; by then the neighbouring youngsters, a month old, were as big as adult geese. Some of the earlier families on the main tree had already flown.

The pelican incubating the third clutch presented one of our first problems, for we never saw it leave the nest over the period of six to seven hours during which we watched, and I never saw its mate bring any food. The problem was solved on a later visit when my wife was with me and noticed an adult pelican arrive and do a very quick change with the incubating bird, who then flew off towards Lake Victoria while its mate carried on incubating. In the excitement of photographing the feeding of the young pelicans in the other two families I had each time missed this quiet but quick change-over. There is no difference in colour or size between the sexes.

The three nests were loosely made of sticks precariously placed along one branch. Two were touching, while the third was perhaps two feet away. There seemed little to keep them in place but the body of the brooding bird. Yet there they remained intact for an incubation period which we estimated to be about thirty-five days,



Four fledgling pelicans waiting for their parents to come back with food from Lake Victoria

followed by a further sixty days minimum during which the young birds remained on, or near, the nest. The periods which I quote have all had to be estimated to the nearest few days as each visit to the pelicanry entailed a return journey of more than a hundred miles over rough roads. Our observations were therefore made over three months, during which we visited the pelicans every twelve to fourteen days.

For the first few days of the nestlings' life they peeped out only occasionally from beneath their brooding parent. They fed on scraps of fish which the adult dribbled onto the nest as she stood over them. After they had eaten their fill she would pick up any food that remained on the nest, but we could not determine whether she kept it in her gullet for a future meal for the chicks or consumed it herself.

Within seven to ten days of hatching the change was enormous. The nestlings no longer needed to be brooded all day as they were now covered by a white down and had grown to the size of a duck. They sat or stood in the nest while the parent stood guard on a branch above. The parent occupied the time preening its feathers, or it just tucked its head between its shoulders and went to

sleep. Occasionally it threw its head in the air, opened its beak and tautened the great pouch until you could see every vein.

By about 7.30 each morning all the adults except those with young chicks had gone off to the lake to fish. As the morning wore on the young pelicans became more and more noisy as their hunger increased, and they stood eagerly watching for their parents. The pouches below their beaks pulsated with ripples of light as the sun shone through the translucent skin, while they thrust forward their heads in a begging action accompanied by a sound suggestive of snarling and groaning. At the height of the breeding-season, when there were several hundred young birds, this guttural snarling sound was tremendous. It could be heard far off as you approached the pelicanry and was intermingled with a clacking sound made by birds tossing their heads in the air and smacking their great beaks shut. Sometimes, on arrival back at the nest, birds would also clap their beaks along that of their mate. Apart from this clapping noise we never heard any sound uttered by the adult pelicans. The snarling came entirely from the young birds and reached its height towards



Snapping with their beaks, pelicans ward off other birds trying to land too near their perches

midday when the parents began to return from Lake Victoria.

We could distinguish the birds coming from the lake from those just soaring round the sky for the pleasure of flight, for the former came in at a great height. They would first be seen as specks in the sky and then appear to roll over—rather like the victory roll of Air Force pilots returning from a successful mission—and come down in a long sweeping spiral. They never landed right on the nest, but alighted on a branch a little distance off and stayed there for some minutes in the most tantalizing fashion while their young got frantic with hunger. Although we could not differentiate between individual birds, the offspring could always recognize their parents as they flew in. I think that the parent during this interval may be regurgitating the fish, for they do not bring it in the pouch as we expected, but in the crop.

Suddenly the parent would drop down to the nest and the most exciting part of the day began. The very young chicks just ate up scraps of fish dropped by the adult onto the nest, but within thirteen days they fed direct from the parent's crop. Leaning back on its rump, with immature wings agitatedly flapping to keep its balance, the

chick would reach right up into the parent's pouch. The parent then stretched its head forward so that the youngster could push its beak and head well down the long neck into the gullet. It was a great struggle. All that could be seen of the young bird was a pair of moving wings and its stern. As it emerged the parent shook its head as though glad to be rid of the hungry beak.

This was the only meal of the day and there was quiet for several hours afterwards as the replete chicks and fledglings sat stolidly digesting the fish. Sometimes a large fish would stay for half an hour or more bulging part-way down the chick's neck until it was finally absorbed. Fish dropped on the ground below the tree weighed three-quarters to one pound.

William Congreve, writing in 1695, is more correct in his observation, 'What, wouldest thou have me turn pelican, and feed thee out of my own vitals?', than Mr D. L. Merritt in his poem:

A wonderful bird is the pelican;
His bill can hold more than his belican.
He can take in his beak
Food enough for a week;
But I'm damned if I see how the helican!